



Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number:

0 046 022
A2

(12)

EUROPEAN PATENT APPLICATION

(21) Application number: 81303370.1

(61) Int. Cl.³: H 01 R 43/00

(22) Date of filing: 23.07.81

(30) Priority: 04.08.80 US 174784

(43) Date of publication of application:
17.02.82 Bulletin 82/7

(84) Designated Contracting States:
DE FR GB IT NL

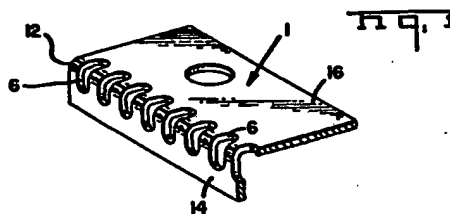
(71) Applicant: AMP INCORPORATED
Eisenhower Boulevard
Harrisburg, Pennsylvania(US)

(72) Inventor: Sprunger, Thomas Ralph
deceased
deceased(US)

(74) Representative: Terrell, Thomas Gwyn et al,
20 Queensmere
Slough, Berkshire SL1 1YZ(GB)

(54) A wire holding jig for apparatus which installs electrical wires into a connector assembly and a method of manufacturing the jig.

(57) A wire holding jig is disclosed, for apparatus which installs electrical wires into a connector, and a method of manufacturing the jig is disclosed, in which a metal blank (1), shown in Figure 1, has a row of apertures (4) formed by etching. A ridge (12) at a bend in the blank (1) is intercepted by the apertures (4) thereby providing wire holding passageways. The peripheries (6) of the apertures are what to keen edges that trim to length, any wires (54) laid into the passageways.



EP 0 046 022 A2

A wire holding jig for apparatus which installs
Electrical wires into a connector assembly, and a method
of manufacturing the jig.

5 This invention relates to a wire holding jig for
apparatus which installs electrical wires into a connector
assembly, and a method of manufacturing the jig.

10 There is disclosed in U. S. A. 3,972,101, apparatus
characterised by a base, on which is positioned an electrical
connector assembly of a type disclosed in U.S.A. 4,127,312,
a pair of wire jigs along opposite sides of the connector
assembly, each jig having fingers separating electrical
wires from one another, as the wires extend from one jig to
the other across the connector assembly and in alignment with
respective electrical terminals of the connector assembly,
15 an insertion tool received on the base and being adapted to
push the wires past a cutting edge on one of the jigs, and
to push the wires, after trimming by the cutting edge, into
the connector assembly and in electrical connection within
wire receiving and connecting slots of the terminals.

20 In this known apparatus, each wire jig is a machined
metal block having a row of projecting fins, spaced apart
from one another and defining therebetween wire separating
passageways. Machine manufacture is costly, and the metal
block adds to the weight of the known apparatus. The one
25 wire jig having the cutting edge requires replacement when
the cutting edge becomes dulled during use or when the jig
is damaged.

The present invention concerns the problem of reducing the weight and cost of manufacturing a jig replacement for a worn or damaged wire jig of the type disclosed in U.S.A. 3,972,101.

5 According to one aspect of the invention, a wire jig for use in the known apparatus is characterised in that; a metal blank is provided with a series of spaced apart apertures, the peripheries of the apertures extend into the thickness of the blank and are concave, the blank
10 includes a bend, each of the apertures intercepts the bend and defines a wire receiving passageway through the bend, and cutting edges are whet along the concave peripheries of the apertures.

 According to another aspect of the invention a
15 method of manufacturing a wire jig according to the invention is characterised by the steps of; masking a metal blank with an etchant resistant substance leaving exposed first areas on a first side of said blank in registration with exposed second areas on a second side of said blank, etching through
20 said exposed areas of said blank to construct a series of apertures through said blank, the apertures having peripheral walls concave into the thickness of said blank, bending at least a partial fold in said blank such that said fold intercepts each said apertures, and whetting cutting edges along
25 the respective peripheries of said apertures.

 The wire jig, being a bent metal blank, is lighter in weight than a machined block. The wire receiving passageways, defined by apertures in the blank, are fabricated by etching and without machining. The concave peripheries of the apertures are readily whetted to a keen edge.
30

 For a better understanding of the present invention reference will now be made by way of example to the accompanying drawings, in which:-

 FIGURE 1 is an enlarged fragmentary perspective of a
35 preferred embodiment of a wire aligning and cutting jig.

 FIGURE 2 is an enlarged fragmentary plan view of an apertured metal blank from which the finished jig, shown in

Figure 1, is made.

FIGURES 3, 4 and 5A are diagrammatic views of the metal blank in section during sequential stages of manufacture thereof.

5 FIGURE 5B is a diagrammatic view of the metal blank in elevation, illustrating an optional manufacturing operation being performed thereon.

FIGURE 6A is a fragmentary perspective of a known wire jig.

10 FIGURE 6B is a perspective of an electrical connector to which plural wires are to be connected after being aligned and trimmed by the known wire jig, or alternatively by the wire jig according to the present invention.

15 FIGURES 7 and 8 are enlarged fragmentary elevations in section of the connector of FIGURE 6B and the wire jig of FIGURE 6A, both in apparatus for trimming wires and inserting trimmed wires into the connector.

20 FIGURE 9 is an enlarged fragmentary elevation in section of the wire jig of FIGURE 1, in the apparatus of FIGURES 7 and 8.

FIGURE 10 is a diagrammatic view of the metal blank in section during trimming and insertion of a wire.

25 FIGURE 1 illustrates a metal blank 1, formed into a preferred embodiment of a wire jig. The jig is manufactured from a bendable metal blank 1, according to process steps, described with reference to additional Figures of the drawings. Figures 2 and 3 illustrate the metal blank having its surface and end edges coated or masked with an etchant resistant substance 2, leaving exposed, by absences of the substance 2 on the blank 1, a series of elongated, generally ellipsoidal, first surface areas 4 on one side of the blank 1. Similar exposed second areas (not shown) are provided on the opposite side of the blank in registration, across the thickness of the blank, with the first areas 4. The blank is
30 then immersed in a suitable metal etchant, which etches through the exposed areas of the blank to construct a series of slotted

apertures, shown at 6 in Figure 3, having the shape of the exposed surface areas on the blank 1. As etching progresses into the blank thickness a concave depression is formed. A concave depression is formed simultaneously from each side of the blank, until the blank thickness is etched through, forming the series of apertures 6. Figure 3 shows an exemplary aperture 6, the periphery of which is doubly concave, at 8A and 8B, into the thickness of the blank. The metal surface produced by etching will have a characteristic appearance familiar to a metallurgist or a technician skilled in recognizing an etched surface.

After etching, the blank is cleaned of etchant residue, and the resist substance 2 is removed by a suitable solvent cleaner. The blank is then formed to a configuration as shown in Figure 7, by bending a partial fold 10 which forms a ridge 12, into the top of which the apertures 6 are recessed. Sloping oppositely away from the ridge 12 are the end portions or legs 14 and 16 of the blank 1. The leg 14 is surface ground by a fine grit grinding wheel 18 to whet sharp cutting edges, by a single pass of the wheel, on the portions of the aperture peripheries 8A which project below the top of the ridge 12. The finished jig is shown in Figure 1.

Figure 5B illustrates an optional manufacturing operation performed by a tapered grinding wheel 20 which enters into each recess 6 to grind each recess with an outwardly flared configuration opening into the top of the ridge 12.

Figure 6A illustrates a known wire jig 22, machined from a single metal block. A base 23 of the jig is integral with a plurality of fingers 24 which are spaced apart by deep, wire aligning recesses 26 intersecting a lip 28, which overhangs an undercut channel 30. The outfacing surface 32 of the lip 28 is ground to provide a precise cutter surface over which a cutting blade is drawn to trim wires to desired lengths.

The jig 22 is mounted to apparatus disclosed, both in aforesaid U.S. 3,972,101, and in Figures 7 and 8 of the present disclosure. The base 23 of the jig 22 is secured by one or more

BAD ORIGINAL

fasteners 34 to a moveable support bar 36 of the apparatus. As disclosed in the aforesaid U.S.A. 3,972,101, the support bar 36 is lowered to push the jig 22 onto the edge of an electrical connector assembly shown in Figure 6B, generally at 38. The connector assembly 38 includes a dielectric housing 40 having a raised lip 42. Rows of slotted plate electrical terminals 44 are contained in the housing. Electrical wires, some of which are shown at 46, are to be trimmed, and then inserted into electrical connection with the terminals. Additional connector portions 48 and 50 nest together and cover the wire connections. Further details of the connector assembly 38 are disclosed in the aforesaid U.S.A. 4,127,312.

As shown in Figures 7 and 8 the connector assembly 38 is located on a base 52 of the apparatus with the lip 42 inset within the channel 30 of the jig 22. The surface 32 of the jig 22 is inside the connector assembly 38, facing the rows of terminals 44. Thereby the connector assembly is positioned for connection of a plurality of wires to the terminals 44. One wire is shown at 54, between the fingers 24 of the jig 22. Figures 7 and 8 further illustrate a portion of an inserter 56, which is part of an insertion tool disclosed in the aforesaid U.S.A. 3,972,101. The inserter is actuated to push the wires 54, in a manner as described in U.S.A. 3,972,101, past the jig surface 32, thereby trimming the wires 54. The inserter pushes the trimmed ends of the wires into the connector, and into connection with respective slotted plate terminals 44.

Figures 9 and 10 illustrate the jig 1 on the support bar 36 in place of the jig 22. The leg 16 is secured by a threaded fastener 58 to the support bar 36. Also secured by the fastener 58 is a V-shaped plate 60. One leg 62 of the plate is secured by the fastener 58 to the bar 36, while the other leg projects above the bar 36 and the jig 1, and is divided into a plurality of comb fingers 64, having a wire separating function similar to the fingers 24 of the jig 22. The fingers 64 serve to initially separate the wires 54 from

one another, and to align the wires over the jig 1. The wires 54 then are draped over the ridge 12 of the jig 1, and in alignment with apertures 6. The apertures 6 provide final separation of the wires from one another, and final
5 alignment of the wires with respective terminals 44 of the connector 38, when the wires are trimmed, in a manner described, as follows.

The connector 38 when mounted on the base 52 will have the lip 42 thereof in a clearance between the leg 14
10 and the base 38. The leg 14 will overlie the lip and enter the connector 38. The inserter 56, when actuated as described in the aforesaid U.S.A. 3,972,101, will push the wires 54 toward the connector 38, forcing the wires into the
15 apertures 6, then past the whetted cutting edges of the apertures 6. The inserter will wipe past the leg 14, trimming the wires to desired lengths. The hollow cutting edges provided by the concave peripheries produce clean severing of the wires. The scraps cut from the wires will remain in and along the apertures 6 and the comb fingers 64. The
20 inserter pushes the trimmed wires into the connector 38 and into connection with respective slotted plate terminals 44, establishing electrical connections of the wires and terminals. The specific details of the connections are disclosed in the aforesaid U.S.A. 4,127,312.

Claims:

1. A jig for aligning and cutting electrical wires comprising, wire receiving passageways distributed along a metal body and a cutting edge associated with each passageway, the passageways retaining and separating
5 electrical wires from one another until passage thereof over the cutting edge; characterized in that the passageways have peripheries etched concavely into the thickness of the body, a ridge intercepts the passageways, and cutting edges are whetted along the peripheries of the
10 passageways.
2. A jig according to Claim 1, characterized in that the ridge is a bent fold in the body.
3. A jig according to Claim 1, characterized in that the passageways are elongated apertures through the
15 thickness of the body and through the ridge.
4. A method of manufacturing a jig according to Claim 1, characterized by the steps of masking the body with an etchant resistant substance, leaving exposed first areas on a first side of said body in registration
20 with exposed second areas on a second side of said, body, etching through the exposed areas and forming a series of apertures through the body, bending at least a partial fold in the blank such that the fold intercepts the apertures, and whetting a cutting edge along the periphery
25 of each of the apertures.
5. A method as recited in Claim 4, characterized by etching the body simultaneously from both of the sides thereof concavely into the thickness of the body.

1/3

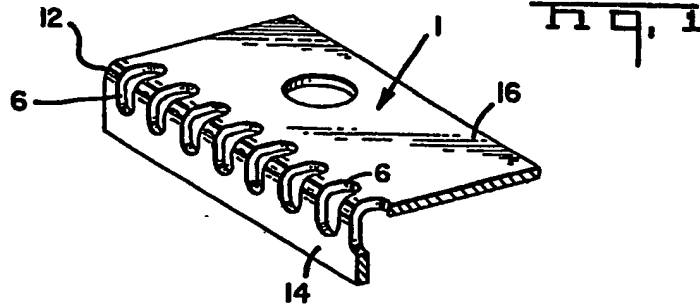
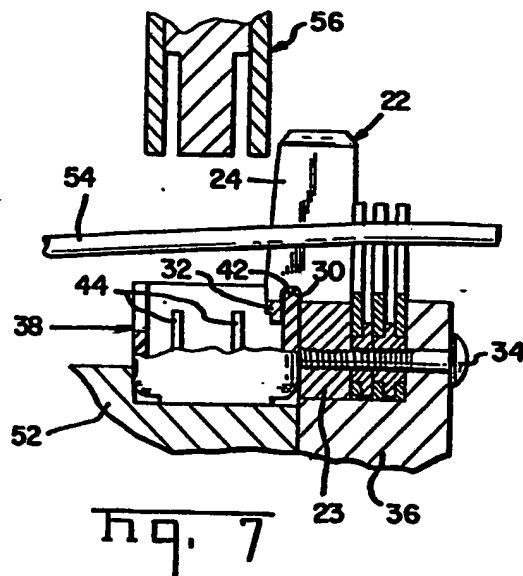
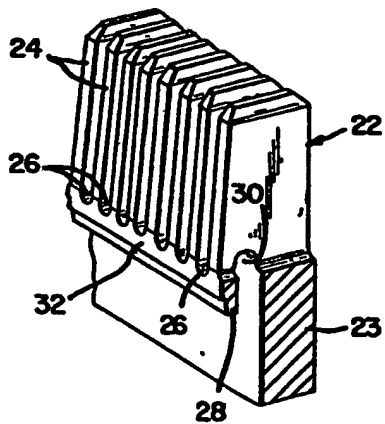
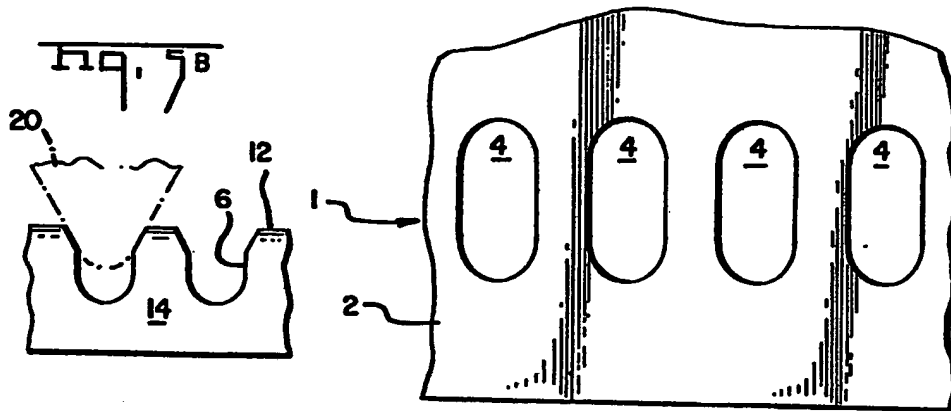
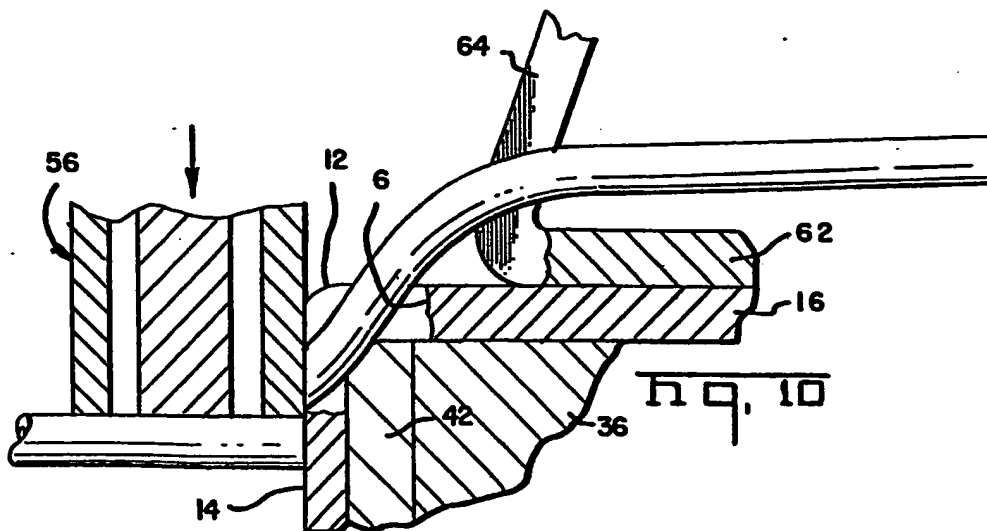
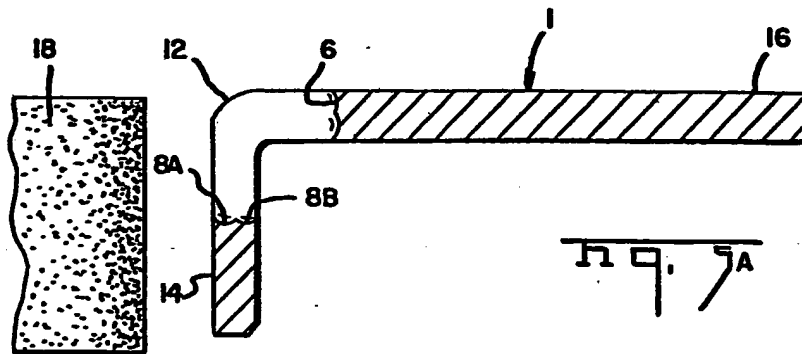
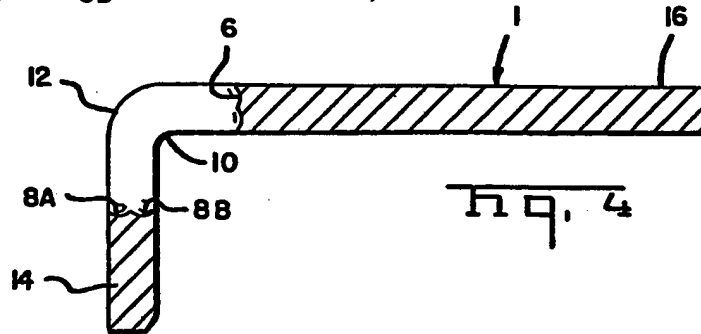
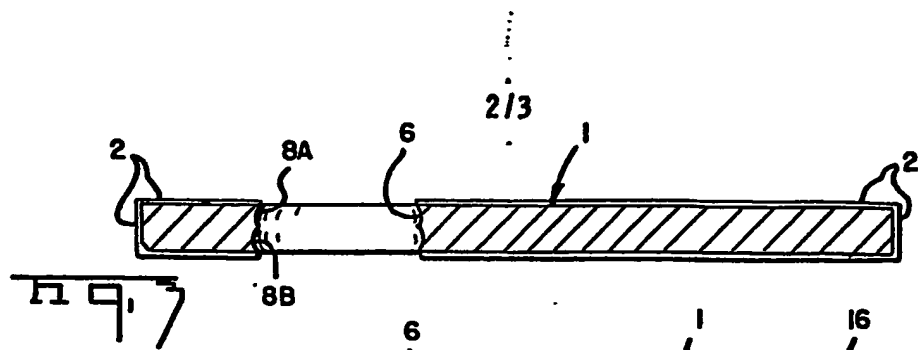


Fig. 2





3/3

